United States Patent [19]

Batchelder

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[54] **METHOD AND APPARATUS FOR DIELECTROPHORETIC MANIPULATION OF CHEMICAL SPECIES**

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[51] **Int. Cl.**[3] **B01D 57/02;** C25B 7/00; C25D 13/00

[52] **U.S. Cl.** ..... **204/180 R;** 204/180 P

[58] **Field of Search** ..... 204/180 P, 180 R

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[57] **ABSTRACT**

The present invention provides method and apparatus for manipulating one or more chemicals within a reaction chamber or housing by dielectrophoretic forces. At least two materials, one of which is a chemical to be manipulated, are provided within the housing. The materials have different dielectric constants. A non-uniform electrical field is applied to the materials within the housing and, as a result of dielectrophoretic forces generated by the applied field, the relative positions of the materials are varied. Accordingly, a chemical can be selectively manipulated to different positions within the housing as, for example, to a catalyst or chemical analyzer located within the housing. The present apparatus may also be used to simultaneously manipulate more than one chemical to mix, or induce a chemical reaction, between the different chemicals in the housing.

20 Claims, 12 Drawing Figures